

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of claims:**

Claims 1-29 (canceled)

30. (Previously Presented) A system for analysis of one or more biomolecules, comprising: (a) a microdevice comprised of (i) a substrate; (ii) a separation channel formed in said substrate, (iii) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (b) means for causing at least a portion of said one or more biomolecules to migrate along said separation channel, thereby separating said one or more biomolecules; and (c) information stored in said memory about a character or a sequence of said one or more biomolecules.

31. (Previously Presented) The system of claim 30, wherein said substrate comprises a plate, wafer, chip, slide, or disc.

32. (Previously Presented) The system of claim 30, wherein said means for causing at least a portion of said one or more biomolecules to migrate along said separation channel comprises an electric field.

33. (Previously Presented) The system of claim 32, further comprising one or more electrodes each capable of being connected to a power source, the one or more electrodes being disposed with respect to at least one of said separation channels for generating said electric field along at least a portion thereof.

34. (Previously Presented) The system of claim 30, wherein said means for causing at least a portion of said one or more biomolecules to migrate along said separation channel comprises a centrifugal force.

35. (Previously Presented) The system of claim 34, wherein said microdevice is a spinning-disc microdevice.

36. (Previously Presented) The system of claim 35, wherein said memory is an optical memory.

37. (Previously Presented) The system of claim 30, wherein the microdevice comprises a plurality of separation channels and said separation channels are non-intersecting.

38. (Previously Presented) The system of claim 30, wherein the rewritable memory is permanently affixed to the substrate.

39. (Previously Presented) The system of claim 30, wherein the rewritable memory comprises at least one of an integrated circuit memory, an optical memory, a thin film semiconductor memory, a ferromagnetic memory, a molecular memory, and a biomolecular memory.

40. (Previously Presented) The system of claim 30, wherein said memory includes a storage capacity of at least 1 megabyte.

41. (Previously Presented) The system of claim 30, further comprising a detector in optical communication with at least a region of the separation channel.

42. (Previously Presented) The system of claim 30, further comprising a temperature-control device adapted to modulate the temperature of at least a portion of said substrate.

43. (Currently Amended) A system for the analysis of one or more biomolecules, comprising: (a) a substrate; (b) an array of polynucleotides supported by said substrate; (c) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (d) a temperature-control device adapted to regulate the temperature

of at least a portion of said substrate; and ~~(d)~~ (e) information stored in said memory about a character or a sequence of said one or more biomolecules.

44. (Currently Amended) The system of claim 43, wherein the ~~further comprising a~~ temperature-control device is adapted to modulate the temperature of at least a portion of said substrate.

45. (Previously Presented) The system of claim 43, further comprising a detector in optical communication with at least a portion of said substrate.

46. (Previously Presented) A system for the analysis of one or more biomolecules, comprising: (a) a substrate; (b) one or more microscale structures in said substrate configured to support one or more biomolecule-containing samples; (c) a rewritable optical memory integrated into said substrate, with said memory being adapted for storing binary coded information.

47. (Previously Presented) The system of claim 46, further comprising a temperature control device adapted to modulate the temperature within at least one of the one or more microscale structures.

48. (Previously Presented) The system of claim 46, further comprising a detector in optical communication with at least one of said one or more microscale structures.

49. (Previously Presented) A system for analysis of one or more biomolecules, comprising: (a) a microdevice comprised of (i) a substrate; (ii) a separation channel formed in said substrate, (iii) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (b) means for causing at least a portion of said one or more biomolecules to migrate along said separation channel, thereby separating said one or more biomolecules; and (c) machine-readable code, executable by a computer, stored in said memory.

50. (Currently Amended) A method for analyzing one or more biomolecule-containing samples, comprising: (a) providing a microdevice comprised of (i) a substrate, (ii) one or more microscale structures in said substrate configured to support said one or more biomolecule-containing samples, and (iii) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (b) providing a station adapted to receive said microdevice, with said station configured to carry out (i) sample processing, and (ii) reading and writing of binary coded information; (c) introducing at least one biomolecule-containing sample into at least one of said one or more microscale structures; (d) placing said microdevice within said station; (e) regulating the temperature of at least a portion of said microdevice; (f) processing said sample within said station; and ~~(f)~~ (g) after said processing, with said microdevice in said processing station, storing information in said memory about results or output generated from use of said processing station.

51. (Currently Amended) The method of claim 50, wherein said ~~processing~~ regulating includes modulating the temperature within at least one of the one or more microscale structures.

52. (Previously Presented) A microdevice for analysis of one or more biomolecules, comprising: a substrate; one or more microscale structures in said substrate configured to support one or more biomolecule-containing samples; a memory integrated into said substrate; machine-readable code stored in said memory; and a microprocessor integrated into said substrate, capable of executing said code.

53. (Previously Presented) The microdevice of claim 52, wherein said microscale structures include one or more of: channels, wells, chambers, reservoirs, and any combination thereof.

54. (Previously Presented) A microdevice for analysis of one or more biomolecules, comprising: a substrate; a polynucleotide array supported by said substrate; a memory integrated

into said substrate; machine-readable code stored in said memory; and a microprocessor integrated into said substrate, capable of executing said code.

55. (Previously Presented) A system for analysis of one or more biomolecules, comprising: (a) a microdevice comprised of (i) a substrate; (ii) a separation channel formed in said substrate, (iii) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (b) means for causing at least a portion of said one or more biomolecules to migrate along said separation channel, thereby separating said one or more biomolecules; and (c) a sample tracking device capable of storing information in said memory about a character or a sequence of said one or more biomolecules.

56. (Currently Amended) A system for the analysis of one or more biomolecules, comprising: (a) a substrate; (b) an array of polynucleotides supported by said substrate; (c) a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information; (d) a temperature-control device adapted to regulate the temperature of at least a portion of said substrate; and ~~(d)~~ (e) a sample tracking device capable of storing information in said memory about a character or a sequence of said one or more biomolecules.